

CLAIMS

What is claimed is:

1. A method comprising:

providing an a substrate having a contact pad, and an under bump metallurgy overlying the contact pad, and a photoresist layer overlying the under bump metallurgy, and wherein the photoresist layer has an opening therein down to the under bump metallurgy and aligned with the contact pad;

pretreating the substrate with a first wetting solution prior to plating a first seed layer over the under bump metallurgy; and
plating a first seed layer over the under bump metallurgy.

2. A method as set forth in claim 1 wherein the step of pretreating comprises spraying the substrate with the first wetting solution.

3. A method as set forth in claim 1 wherein the step of pretreating comprises spraying the substrate with the first wetting solution so that the sprayed first wetting solution includes particles having a diameter less than the diameter of the opening in the photoresist layer.

4. A method as set forth in claim 1 wherein the opening in the photoresist layer has a diameter less than 100 micrometers and wherein the step of pretreating comprises spraying the substrate with the first wetting solution so that the sprayed first wetting solution includes particles having a diameter less than 100 micrometers.

5. A method as set forth in claim 1 wherein the sprayed first wetting solution particles have a diameter ranging from 10-100 micrometers.

6. A method as set forth in claim 1 further comprising the step of plating a second seed layer over the first seed layer.

7. A method as set forth in claim 1 wherein the step of plating a first seed layer over the under bump metallurgy comprises dipping the substrate in a plating bath.

8. A method as set forth in claim 7 wherein the step of plating a first seed layer over the under bump metallurgy comprises dipping the substrate in an electroplating bath.

9. A method as set forth in claim 1 further comprising the step of pretreating the substrate having the first seed layer thereon with a second wetting solution prior to plating a second seed layer over the first seed layer, and further comprising plating a second seed layer over the first seed layer.

10. A method as set forth in claim 9 wherein the step of pretreating the substrate having a first seed layer thereon comprises spraying the substrate with the second wetting solution so that the sprayed second wetting solution includes particles having a diameter less than the diameter of the opening in the photoresist layer.

11. A method as set forth in claim 9 wherein the opening in the photoresist layer has a diameter less than 100 micrometers and wherein the step of pretreating the substrate having a first seed layer thereon comprises spraying the substrate with the second wetting solution so that the sprayed second wetting solution includes particles having a diameter less than 100 micrometers.

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12. A method as set forth in claim 9 wherein the sprayed second wetting solution particles have a diameter ranging from 10-100 micrometers.

13. A method as set forth in claim 9 further comprising the step of depositing an electrically conductive material over the first seed layer.

14. A method as set forth in claim 9 wherein the first seed layer comprises copper.

15. A method as set forth in claim 9 wherein the second seed layer comprises nickel.

16. A method as set forth in claim as set forth in claim 9 wherein the first seed layer comprises copper, and wherein the second seed layer comprises nickel.

17. A method as set forth in claim 1 wherein the under bump metallurgy comprises a first and second layer.

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18. A method as set forth in claim 17 wherein the first layer of the under bump metallurgy comprises titanium, and wherein the second layer of the under bump metallurgy comprises copper.

19. A method as set forth in claim 1 wherein the wetting solution comprises deionized water.

20. A method as set forth in claim 9 wherein the wetting solution comprises deionized water.

21. An apparatus comprising:

a wafer jig constructed and arranged to carry a semiconductor wafer therein, and wherein the wafer jig includes an opening therein for exposing a top surface of the semiconductor wafer;

a wetting solution supply tank connected to a pump, and the pump connected to a spray module for pumping wetting solution through a spray module and onto a semiconductor wafer carried in the wafer jig.

22. An apparatus as set forth in claim 21 wherein the spray module and the wafer jig are constructed and arranged to be movable with respect to each other.

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23. An apparatus as set forth in claim 21 further comprising wafer jig holding machine constructed and arranged for oscillating reciprocally the wafer jig in at least a vertical direction with respect to the spray module.

24. An apparatus as set forth in claim 21 wherein the spray module includes a plurality of spray nozzles each constructed and arranged to spray wetting solution particles having a diameter less than 100 micrometers.

25. An apparatus as set forth in claim 21 wherein the spray module includes a plurality of spray nozzles each constructed and arranged to spray wetting solution particles having a diameter ranging from 10-100 micrometers.

26. An apparatus as set forth in claim 21 wherein the spray module includes three spray nozzle arranged in a triangular shape.